

This year the IPLA Special Edition will be dedicated to best practices in the following curricular areas: *Reading, Math, Science, and Social Studies*. The focus of this issue is **Science**. Distinguished Indiana school leaders have shared methods and strategies for improving science strategies.

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## The Science Lab... Stress or Success?

*Kristen Prusiecki – 7th grade science teacher,  
Raymond Park Middle School*

You know the drill! It's time for another science experiment and it's the old favorite, "What Foods Contain Carbon Dioxide?" You think it'd be easy, right? Just ask your seventh-graders to start with some bromthymol blue in test tubes, add some food samples, and see what color change occurs. Did you prepare by having all the chemicals/food samples available? Check! Did you instruct your students about this particular lab activity? Check! Was your experiment a success? No way! Some test tubes were missing and broken, food had been eaten, and the teacher now needed to consume the *Alka Seltzer*® instead of using it in the lab activity! What on earth happened? Didn't all the science methods courses say that adolescents developmentally need things like hands-on activities and meaningful participation? Where is the National Middle School Association when you need it?

This looks like a job for the ever-famous Bill Nye, the Science Guy!...or maybe what's really needed is structure within the procedure. What I've found to be an effective organizational pattern for my lab activities is to consistently have all six features of the scientific method (purpose, research/gathering materials, hypothesis, experiment/procedure, analysis, and conclusion) presented and elaborately detail the procedure. Adolescents need structure and clear limits in general, so it seems that it should also apply to the lab setting as well. By using detailed step-by-step instructions, you have given them the structure they need in order to be successful at accomplishing the task.

Just imagine if you were told to build a birdhouse. You know it's supposed to hold birds and that wood and nails might be involved. But might it be helpful if there were a birdhouse blueprint...and even better if that blueprint had step-by-step instructions? Well, our middle-school students are in the same

*(continued on page 6)*





# Robert Eaker

## *Building a Professional Learning Community*

**November 18, 2004 • 8am-4pm**  
**at the Sheraton Indianapolis Hotel & Suites/Keystone at the Crossing**

Name \_\_\_\_\_ IPLA Group Number \_\_\_\_\_  
(if applicable)

First Name for Name Tag \_\_\_\_\_

**Position:** ☐ Central Office ☐ Principal ☐ Asst. Principal ☐ Teacher ☐ Other  
(check one)

Corp./Organization Name \_\_\_\_\_

Corporation Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

School Name \_\_\_\_\_ School No. \_\_\_\_\_

School Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Phone \_\_\_\_\_ E-Mail Address \_\_\_\_\_

Home Address (if not employed in a school corporation) \_\_\_\_\_

City, State, Zip \_\_\_\_\_

This is an RSVP event. Please complete this registration form and return it with a check or P.O. made out to the IPLA Alumni Association. Your fee of \$50 will cover your registration and cost of food at breaks. Hotel and lunch costs will be the participant's responsibility.

**RSVP by November 1, 2004**

Please check method of payment.

☐ Check # \_\_\_\_\_

☐ PO # \_\_\_\_\_

Make checks payable to:  
IPLA Alumni Association

**Make checks payable to IPLA Alumni Association, Inc. Mail registration form to:**  
**Krista Orton - IPLA - Room 229, State House - Indianapolis, IN 46204**  
**Telephone: (317) 232-9004 Fax: (317) 232-9005**



# Life Science in Indiana

*John Demerly – Indiana Department of Education*

Indiana's \$13.6 billion life sciences industry employs more than 82,000 workers in nearly 900 companies, which is a concentration of 50% greater than the national average. Indiana is one of just a handful of regions with over \$200 million in life sciences academic research commitments and more than 10,000 life sciences college graduates each year.

*Source: Introductory Overview, [www.biocrossroads.com](http://www.biocrossroads.com), 2004*

Indiana's life sciences industry includes agriculture, pharmaceuticals, surgical and medical instruments medical laboratories and much more and is supported by a strong base in higher education. Purdue University alone, a major research university, has significant and substantial links to the pharmaceutical and agricultural industries represented by Dow AgroSciences and Eli Lilly that characterize Indiana's additional growth potential in the life sciences industry in the area of food, fiber and natural resources.

In order for the life sciences industry to continue to grow and prosper in Indiana, it needs a pool of well-educated high school and university graduates. To ensure agricultural education and science education in Indiana schools are both rigorous, relevant and among the best in the country, a project was initiated to develop standards for three new advanced life science courses that emphasize agricultural science. A panel comprised of representatives from higher education, agricultural education and science education developed standards. Three new courses, based on these standards, will be designed with the following objectives:

- Allow students to become acquainted with the work and research of the life sciences industry in Indiana;
- Develop a clear set of expectations for Indiana high school students in agriculture science that lead to success in a postsecondary science, agriscience, or an engineering program for Indiana high school students;
- Strengthen and/or revise Indiana's current high school agriscience



COURTESY DOW AGROSCIENCES

standards to align them with postsecondary science content knowledge and skill expectations;

- Create new high school agriculture education benchmarks in science that all schools may use to analyze and prepare local agriculture and science curriculum.

Based upon these objectives, a panel of experts comprised of chemistry and biology professors from seven institutions of higher education, Purdue School of Agriculture professors, secondary agricultural science teachers, Dow AgroSciences personnel, Department of Education staff, and the Council for Agricultural Science and Technology at Iowa State University worked to develop standards for three new Advanced Life Science Courses.

These courses are:

- Advanced Life Sciences: Foods
- Advanced Life Sciences: Animals
- Advanced Life Sciences: Plants and Soils

The standards for these courses will be online for public review and comment in February with final approval of the courses by the State Board of Education scheduled for May. Pending approval from the Commission for High Education, the courses receive Core 40 and Academic Honors credit in science.

For more information, contact John Demerly at 317-232-9171 or [demerly@doe.state.in.us](mailto:demerly@doe.state.in.us)



## AlumniNews

### Building A Culture Of Achievement In Your School Community

Bob McDaniel – IPLA Alumni Vice-President

Imagine returning from a conference with a team of teachers from your school, teachers talking non-stop:

*“I felt so refreshed after attending the IPLA Winter Conference! Both Harry Wong and Joe Clark were such inspiring speakers.”* –First grade teacher

*“...The conference was wonderful...he [Harry Wong] spoke in such a manner that you got really excited to go back and try new things to make sure that you are doing all you can do for what's best for kids.”* –Kindergarten teacher

We had this experience after taking a team of eight teachers to the IPLA Winter Conference last January, sponsored by the IPLA Alumni Association. Included in our team were the two co-chairs of our school improvement steering committee, two teachers who serve as the coaches for our writing goal, two teachers who chair our math problem solving committee, and two teachers whose names were drawn at random from the remaining member of our staff who wanted to attend the conference. The teachers returned to the classroom rejuvenated and inspired. As one teacher said, “Not just one or two people have come back motivated and ready to teach...the knowledge gained and the motivation felt can now be spread throughout the school much more quickly and by a wide variety of individuals.”

Why was it important and beneficial for principals to send teams of teachers to the Winter Conference? “Building a culture of achievement in a school community” and using a “team approach to successful practices” are two of the goals set by IPLA’s Blue Ribbon Design Team in 1999. By opening up the conference to principals and their school improvement teams the past three years, the IPLA Alumni Association Board of Directors has assisted schools to develop as professional learning communities. Through conferences designed to include nationally recognized educational experts and statewide practitioners who focus on timely and relevant topics, IPLA is providing the opportunity to help all Indiana educators better serve the needs of our students. According one third grade teacher, “Attending IPLA was an experience every serious educator should do at least once.”

“Attending the IPLA meeting was equal to getting your batteries charged!” another third grade teacher stated. Everyone – principals, teachers, and support staff – need professional development opportunities periodically to reenergize them on their continuous journey to reach school improvement goals. IPLA’s goals require that principals facilitate system-wide leadership



opportunities, provide for the infusion of best practice with school visions, and build a culture of achievement in their school communities. Every principal needs to regularly ask the question, “What am I doing as a school leader to help my school team build a culture of continuing growth and achievement in my school community?” Part of the answer to that question can be found in the programs and activities offered by IPLA. As one of our writing coaches at our school said to the principal, “Thank you for giving me the opportunity to attend IPLA. I can clearly see why this organization is important to you – professionalism abounds within this group!”

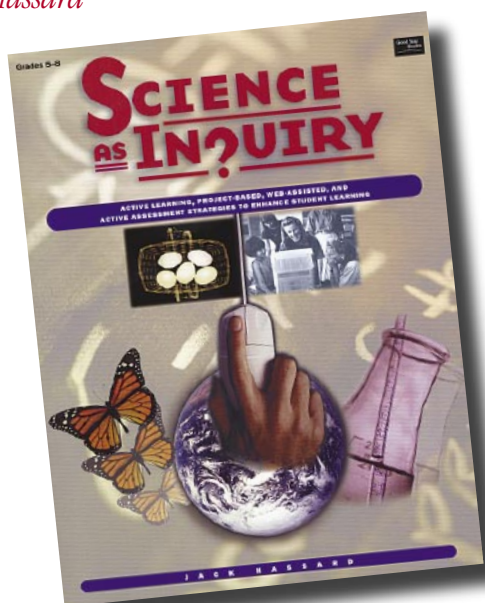


## BOOKS FOR LEADERS

### Science As Inquiry:

Active Learning, Project-Based, Web-Assisted, and Active Assessment Strategies to Enhance Student Learning

by Jack Hassard

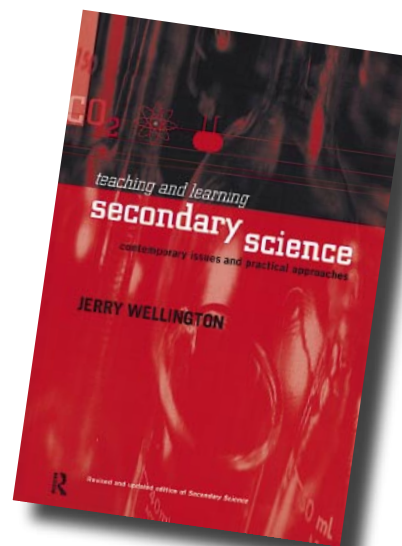


Turn students on to science with these brilliant suggestions and ideas written by master science teacher, Jack Hassard. This book brings together a variety of teaching strategies and problem-oriented projects that let students experience the inquiry process and excitement of science. An inspiring addition to any science program, *Science as Inquiry* provides fresh ideas and approaches, plus active learning opportunities, and web-assisted, project-based assessment strategies. Grades 5-8.

### Teaching and Learning Secondary Science:

Contemporary Issues and Practical Approaches

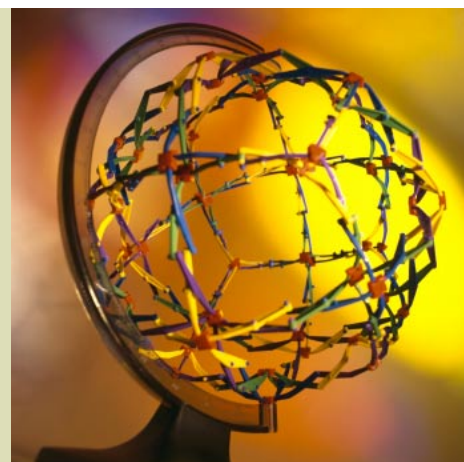
by Jerry Wellington



In *Teaching and Learning Secondary Science*, Jerry Wellington (with Mick Nott and Jon Scaife) discusses the major issues in science education today. This discussion is used to support very practical resources for teachers in training, practicing teachers and mentors.

*In science the credit goes to the man  
who convinces the world, not to the man  
to whom the idea first occurs.*

— Sir Frances Darwin, April, 1914



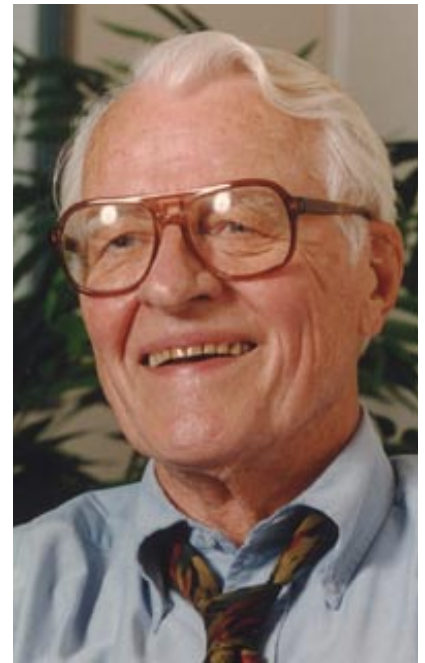


## ALUMNI SPOTLIGHT

**Learning Through Doing** – Doug DeLaughter, Group 39, seen describing a role-playing skit to Arlington Heights Elementary students. This picture, with an accompanying article, was featured in the *Bloomington Herald Times* in December of 2003. Photo by Monty Howell.

## IPLA WOULD LIKE TO RECOGNIZE FORMER GOVERNOR ROBERT ORR.

“Governor Orr was a visionary for school reform when he implemented the A+ program in 1987. Many of the components of A+ remain in effect and are contributing to higher student academic achievement and a continuous focus on school improvement in Indiana,” stated Superintendent of Public Instruction, Dr. Suellen Reed, regarding the passing of Governor Orr. The Indiana Principal Leadership Academy was formed under the A+ Program.



*SCIENCE LAB continued from page 1*

boat (or birdhouse). They want to do the experiment! They know the overall goal, but to accomplish the goal they need specific instructions to give them structure.

So...let's get back to that carbon dioxide experiment. From personal teaching experience, I believe it's important to take nothing for granted. It's better, for example, to be specific and detailed in giving instruction with regard to the size or amount as opposed to using words like “some” or “a little.” A few students might intuitively know the desired amount; however, generally students appreciate the reassurance of specific directions so that guessing is not a variable. Moreover, variations from something like 5 ml to 10 ml, if left to the student's discretion, will affect the outcome of results. My rule of thumb is that every step of the scientific procedure should be readily understandable by whomever might enter my room.

Look at the some of these steps in the procedure for that carbon-dioxide lab activity and see if “no stone has been left unturned,” if all ambiguity has been removed, and if the steps are clear.

1. Each test tube should contain 10ml of bromthymol blue solution. (If they do not, raise your hand and I will help you.) Apply a small piece of masking tape to each tube in order to provide space for a number. Using a pencil, please label your seven test tubes with numbers 1-7.

2. STOP!! Before beginning the remainder of the lab, use the space provided in your data table to hypothesize what you think will happen when different items are added to the various test tubes.

3. Before adding any item to the test tube, be sure to read all of the instructions! Treat the test tubes as described below:

#1 - Add nothing

#2 - Put your safety goggles on and gently blow into the test tube with the straw. You should produce slow, gentle bubbles. BE CAREFUL - DO NOT SUCK THE LIQUID INTO YOUR MOUTH!! Do this for approximately 15-30 seconds. Note any color change that occurs. Record this observation in the data table.

#3 - Break an Alka Seltzer® tablet into pea-sized pieces and place one of the pieces into your test tube. Record any color change in the data table.

And so on ....

By giving students structure in the procedure for data collection, analysis and conclusions can then be drawn. As Bill Nye might say, “‘Science’ and ‘structure’ start with ‘s’ and those combine to spell ‘success!’”



## The Science Education Foundation of Indiana (SEFI)

*Deb Robertson  
SEFI Program Director*

It's no understatement to say that Indiana's educators have a job that grows more difficult every day.

Science education presents a special challenge. Thirty-eight percent of Indiana's fifth-graders failed the state's first ISTEP+ Science test this year, while only seven percent of students received a "pass-plus" score. With a lack of professional development opportunities in the sciences, it will be difficult for teachers to gather the tools to improve these results.

There is a group that wants to help. The Science Education Foundation of Indiana (SEFI) is a non-profit organization dedicated to strengthening science education in the Hoosier State. SEFI supports Indiana's statewide network of science fairs and also examines the "big picture" issues confronting science education.

SEFI has formed a coalition of educators, corporate interests and non-profit leaders to concentrate on challenges to implementing effective science education in our schools. This group, the Indiana Science Education Alliance (ISEA), has identified three major areas of focus for 2004:

- **Create a statewide marketing plan that connects young people with Indiana science careers.**
- **Implement a comprehensive professional development curriculum for K-12 science teachers.**
- **Advocate changes that allow teachers to engage in significant science education professional development.**

We hope you will support these efforts. Indiana's focus on building its biotechnology sector puts the sciences in the spotlight. Life science companies depend first and foremost on human capital - SEFI and our partners feel that strengthening K-12 science education is a critical investment in tomorrow's economy. In the same vein, science education opens new horizons for our young people - many of our fastest-growing industries and cutting-edge careers are within the scientific fields.

For these reasons and others, SEFI and the Science Alliance feel that it's a critical and realistic goal to gain more resources and programming for science education in Indiana. Working together, we can make it happen.

SEFI's website ([www.sefi.org](http://www.sefi.org)) is a great source for the latest news and information on science education in Indiana, providing helpful website links and other tools that can be used in the classroom. The Indiana Science and Engineering newsletter, posted on the SEFI website, features cutting edge math and science research that teachers can use to help introduce their students to careers in the sciences. You can also sign up to receive this free quarterly e-newsletter, which will also be used to update recipients on the progress of science activities, professional development and competitions. We are always looking for content suggestions, so send any ideas and requests to receive the free e-newsletter to Bill Gilmore, Executive Director, Science Education Foundation of Indiana ([wkgilm@indy.rr.com](mailto:wkgilm@indy.rr.com) / 317-733-0692) or Deb Robertson, Program Manager, Teacher's Resource Center ([ddrobert@iupui.edu](mailto:ddrobert@iupui.edu) / 317-466-0362).



# *ipla*

## **Indiana Principal Leadership Academy**

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# C A L E N D A R

**June 10**

Aspiring Principal Academy

DOE – Indianapolis, IN

**June 10-11**

Alumni Board Meeting

DOE – Indianapolis, IN

**June 21**

Group 41 Orientation

Seasons Conference Center – Nashville, IN

**June 22-23**

Groups 40 and 41 – IPLA Session

Seasons Conference Center – Nashville, IN

**June 30**

Effective Professional Development for Your Staff

DOE – Indianapolis, IN

**July 28-29**

Coaching Cadre II, Days 1 & 2

DOE – Indianapolis, IN

**August 4**

Aspiring Principal Academy SOUTH

Spring Mill State Park – Mitchell, IN

**September 3**

Aspiring Principal Academy INDIANAPOLIS

DOE – Indianapolis, IN

## **IPLA STAFF**

**Vince Barnes**

Executive Director

[vbarnes@doe.state.in.us](mailto:vbarnes@doe.state.in.us)

**Becca Lamon**

Associate Director

[blamon@doe.state.in.us](mailto:blamon@doe.state.in.us)

**Cindy George**

Program Coordinator

[cgeorge@doe.state.in.us](mailto:cgeorge@doe.state.in.us)

**Krista Orton**

Financial Officer

[krigdon@doe.state.in.us](mailto:krigdon@doe.state.in.us)

For more information on the  
**Indiana Principal Leadership Academy**,  
call 317-232-9004, fax 317-232-9005  
or visit [www.doe.state.in.us/ipla](http://www.doe.state.in.us/ipla)

**Andy Roberts**, *Special Edition* Designer, [andy@tangentialnet.com](mailto:andy@tangentialnet.com)